

ABSTRACT OF THE DISCLOSURE

A method for obtaining a global optimal solution of general nonlinear programming problems includes the steps of first finding, in a deterministic manner, all stable equilibrium points of a nonlinear dynamical system that satisfies conditions (C1) and (C2), and then finding from said points a global optimal solution. A practical numerical method for reliably computing a dynamical decomposition point for large-scale systems comprises the steps of moving along a search path $\varphi_t(x_s) \equiv \{x_s + t \times \hat{s}, \quad t \in \mathbb{R}^+\}$ starting from x_s and detecting an exit point, x_{ex} , at which the search path $\varphi_t(x_s)$ exits a stability boundary of a stable equilibrium point x_s using the exit point x_{ex} as an initial condition and integrating a nonlinear system to an equilibrium point x_d , and computing said dynamical decomposition point with respect to a local optimal solution x_s wherein the search direction \hat{s} is e x_d .